

## CLAIMS

We claim:

1. A process of synthesizing semiconductor fibers, the steps comprising: forming a catalytic metal on a substrate, placing the  
5 combination in a pressure chamber, adding gaseous reactant, applying sufficient microwave energy to raise the temperature in the chamber to a point above the melting point of the metal and continuing the process until fibers of the desired length are formed.

2. The process of claim 1, wherein the substrate is silicon, the catalytic metal is gallium or indium, and the gaseous reactant is hydrogen and the fibers are silicon.

3. A process of synthesizing silicon fibers, the steps comprising:

15 forming a gallium layer of about 100 microns on a silicon substrate, placing the combination in a pressure chamber, reducing the pressure in the chamber to 50 Torr, adding hydrogen gas, applying sufficient microwave power to raise the temperature in the chamber to 50°C and continuing the process until the fibers is of  
20 the desired length.